
Control of B cell development by the histone H2A deubiquitinase MYSM1.

Journal: Immunity

Publication Year: 2011

Authors: Xiao-Xia Jiang, Quan Nguyen, YuChia Chou, Tao Wang, Vijayalakshmi Nandakumar, Peter Yates, Lindsey Jones, Lifeng Wang, Haejung Won, Hye-Ra Lee, Jae U Jung, Markus Muschen, Xue F Huang, Si-Yi Chen

PubMed link: 22169041

Funding Grants: Dual targeting of tyrosine kinase and BCL6 signaling for leukemia stem cell eradication

Public Summary:

Epigenetic histone modifications play critical roles in the control of gene transcription. Recently, an increasing number of histone H2A deubiquitinases have been identified and characterized. However, the physiological functions for this entire group of histone H2A deubiquitinases remain unknown. In this study, we revealed that the histone H2A deubiquitinase MYSM1 plays an essential and intrinsic role in early B cell development. MYSM1 deficiency results in a block in early B cell commitment and a defect of B cell progenitors in expression of EBF1 and other B lymphoid genes. We further demonstrated that MYSM1 derepresses EBF1 transcription in B cell progenitors by orchestrating histone modifications and transcription factor recruitment to the EBF1 locus. Thus, this study not only uncovers the essential role for MYSM1 in gene transcription during early B cell development but also underscores the biological significance of reversible epigenetic histone H2A ubiquitination.

Scientific Abstract:

Epigenetic histone modifications play critical roles in the control of gene transcription. Recently, an increasing number of histone H2A deubiquitinases have been identified and characterized. However, the physiological functions for this entire group of histone H2A deubiquitinases remain unknown. In this study, we revealed that the histone H2A deubiquitinase MYSM1 plays an essential and intrinsic role in early B cell development. MYSM1 deficiency results in a block in early B cell commitment and a defect of B cell progenitors in expression of EBF1 and other B lymphoid genes. We further demonstrated that MYSM1 derepresses EBF1 transcription in B cell progenitors by orchestrating histone modifications and transcription factor recruitment to the EBF1 locus. Thus, this study not only uncovers the essential role for MYSM1 in gene transcription during early B cell development but also underscores the biological significance of reversible epigenetic histone H2A ubiquitination.

Source URL: <http://www.cirm.ca.gov/about-cirm/publications/control-b-cell-development-histone-h2a-deubiquitinase-mysm1>